

REMARKS

Present Status of the Application

Claim 3 is objected to because of informality as pointed out by the Examiner. Correction of the informality has been made as instructed by the Examiner.

The Office Action rejected claims 1, 2 and 7 under 35 U.S.C. 112, 2nd paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Office Action rejected claims 1-5, and 7 under 35 U.S.C. 103(a) as being unpatentable over Mori et al (US 2002/0025089; Mori hereinafter) in view of Fujinaka (WO02/10602, US Patent 6,832,853 is reference as an English translation; Fujinaka hereinafter).

The Office Action further rejected claim 6 under 35 U.S.C. 103(a) as being unpatentable over Mori, in view of Tanaka (US Patent 5,683,183; Tanaka hereinafter).

Claims 1-3, and 6 have been amended, and claims 8 and 9 are newly added. Support for the amendments can be found from the specification and the drawings. There is no new matter entered thereby.

Discussion of the claim objection

Claim 3 is objected to because of informality as pointed out by the Examiner.

In response thereto, correction of the informality has been made as instructed by the Examiner, and therefore the objection made to claim 3 is solicited to be withdrawn.

Discussion of the claim rejection under 35 USC 112

The Office Action rejected claims 1, 2 and 7 under 35 U.S.C. 112, 2nd paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In response thereto, Applicants have amended claims 1 and 2, and submit that claims 1, 2, and 7 are now in allowable form.

Discussion of the claim rejection under 35 USC 103

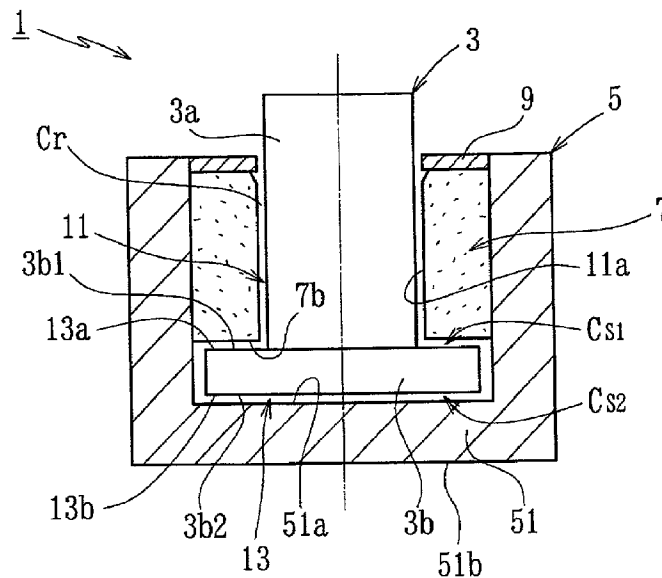
The Office Action rejected claims 1-5, and 7 under 35 U.S.C. 103(a) as being unpatentable over Mori in view of Fujinaka.

Applicants respectfully traverse the above rejections and submit that claims 1-5, and 7 are neither taught, disclosed, nor suggested by Mori, Fujinaka, or any of the other cited references, taken alone or in combination, and thus should be allowed.

With respect to claim 1, recites the limitations of “wherein said housing is made of resin and has a cylindrical side portion and a ring-shaped seal portion **integrally extending from an upper end of said side portion in an inner radial direction**”, and “wherein a seal space is

defined between an inner peripheral surface of said seal portion and an outer periphery of said axial portion, and **an internal space of said housing sealed with said seal portion is filled with the lubricating oil and an oil level of the lubricating oil is maintained within said seal space**” which is neither taught, disclosed, nor suggested by Mori, Fujinaka, or any of the other cited references, taken alone or in combination (emphasis added).

Fig.2



In rejecting claim 1, addressing to the foregoing limitation, the Examiner relies upon Mori. The Examiner designated item 9 in reading on the ring shaped seal portion, and relies upon the case law of *In re Larson* which recites “it is well settled that to make two separate elements integral is obvious to one of ordinary skill in the art”. However, as shown in Fig. 2, the item 9 must be separately and individually configured, and later assembled after the bearing member 7 is inserted. Or otherwise, if as suggested by the Examiner that the item 9 and the

housing 5 are integrally extending from the upper end of the side portion, the device of Mori would have been inoperable, since the bearing sleeve cannot be assembled into the housing.

Further, the Examiner contended: “as assembled, the ring is deemed to be integral to the housing”. Applicants submit that the limitation is “wherein said housing ... has a cylindrical side portion and a ring-shaped seal portion integrally extending from an upper end of said side portion in an inner radial direction”, and should be considered in its entirety. Even as assembled as shown in Fig. 2 of Mori, that’s the item 9 only (excluding the side portion), which extends from an upper end of the side portion in an inner radial direction. As such, Mori fails to teach the limitation of “wherein said housing is made of resin and has a cylindrical side portion and a ring-shaped seal portion integrally extending from an upper end of said side portion in an inner radial direction”.

Further, as shown in Fig. 2, Mori fails to teach an identifiable seal space “wherein a seal space is defined between an inner peripheral surface of said seal portion and an outer periphery of said axial portion, and an internal space of said housing sealed with said seal portion is filled with the lubricating oil and an oil level of the lubricating oil is maintained within said seal space”. Although Mori teaches in general “the bearing member 7 is formed of soft metal or sintered metal impregnated with oil or the like” (paragraph 0022), Mori fails to teach filling the oil in an internal space of the housing. Therefore, Mori teaches nothing about to maintain an oil level of the oil at a certain place.

As such, the present invention, as set forth in claim 1 is submitted to be novel and unobvious over Mori, Fujinaka, or any of the other cited references, taken alone or in

combination, and thus should be allowed.

Similarly, claim 2 recites: “wherein a seal space is defined between an inner peripheral surface of said seal portion and an outer periphery of said axial portion, and an internal space of said housing sealed with said seal portion is filled with the lubricating oil and [[the]] an oil level of the lubricating oil is maintained within said seal space”, which is also neither taught, disclosed, nor suggested by Mori, Fujinaka, or any of the other cited references, taken alone or in combination, and thus should be allowed.

With respect to claim 3, recites: “wherein said housing is made of resin, and a seal member is fixed on said end by welding”.

In rejecting claim 3, the Examiner admitted: “Mori does not disclose a seal member on the end where the thrust member is located and fixed on the end by welding”. Then the Examiner recites Fujinaka as a secondary reference in teaching that “a thrust member (7) attached to one end of the housing and a seal member (9) fixed on the end by welding to prevent leakage (col. 4, lines 66 to col. 5, line 10)”.

Applicants submit that there is no motivation to do so. The cap 9 of Fujinaka is provided preventing leakage of the housing. However, as shown in Fig. 2, the end of the housing of Mori, which is suggested to be welded with a seal member, is in fact an integral part of the housing 5, and therefore those skilled in the art won't be motivated to provide an additional seal member fixed to the end of Mori by welding. In addition, the end of the housing of Mori also serves as a

thrust portion that constitutes a dynamic thrust bearing portion in cooperation with the flange portion. Therefore, Mori does not need a thrust member to be attached to the end of the housing.

With respect to claim 4, recites: “wherein said housing is made of resin, and said bearing sleeve is made of sintered metal, and wherein said bearing sleeve is fixed on said inner periphery of said housing by welding”.

In rejecting claim 4, the Examiner admitted: “Mori does not disclose the sleeve fixed on the inner periphery of the housing by welding”. Then the Examiner contended: “Fujinaka teaches the known use of heat or ultrasonic welding to secure elements to each other, the welding providing an advantage that the likelihood of deformation is low (col. 5, lines 1-10).

However, Fujinaka’s teaching regarding the ultrasonic welding is not deemed to motivate those skilled in the art to modify Mori to weld the sleeve to the housing.

Welding, or ultrasonic welding is certainly known to those skilled in the art including Fujinaka. Fujinaka teaches to employ the ultrasonic welding in fixing the cap 9 to the bearing boss 2, because “in the case of press-fitting, cap 9 is sometimes deformed which degrades the perpendicularity of thrust plate 7 with respect to shaft 4, and in the case of bonding, the adhesive sometimes chemically reacts with the lubricant to degrade the lubricant” (see col. 3 line 66 to col. 4 line 9). Fujinaka also teaches that the cap 9 is molded with the same resin as bearing boss 2 (see col. 4, lines 12-13).

Comparing with the cap 9 which is made of resin, the bearing sleeve required by claim 4 of the present invention is made of sintered metal having pores opened to the surface thereof,

wherein melted resin generated by welding at the fixing portion between the bearing sleeve and the housing can be impregnated into the pores of the bearing sleeve through the surface openings thereof to effectively fix the bearing sleeve and the housing by anchor effect. Therefore, the motivation given by the Examiner for modifying Mori with Fujinaka's teaching, i.e., "welding providing an advantage that the likelihood of deformation is low" is moot.

Further, even though Fujinaka teaches to employ the ultrasonic welding in fixing a resin-made cap 9 to a resin-made bearing boss 2, he still fails to teach, disclose, or suggest to fix a sintered metal made bearing sleeve to a resin-made housing. Fujinaka teaches: "oil impregnated sintered bearing 3 is press-fitted into the inner wall of boss 2 (made of resin)" (see col. 3, lines 15-16).

Please note, Fujinaka teaches to fit the sintered bearing 3 in the bearing boss 2 by press-fitting, rather than by welding which is known and taught in his disclosure in securing elements to each other. In this manner, Fujinaka teaches away from modifying Mori to secure the bearing member 7 to the cylindrical housing 5 for arriving at the claimed invention as set forth in claim 4.

Claim 5 recites: "... a thrust member attached to **one end of said housing**; and a seal member attached to **the other end of said housing** ... wherein said housing is made of resin, and said seal member is fixed on said other end of said housing by welding".

Applicants submit that the thrust member and the seal member are required to be attached to two ends of the housing, as set forth in claim 5 of the present invention, and this limitation is neither taught, disclosed, nor suggested by Mori, Fujinaka, or any of the other cited references,

taken alone or in combination.

Although Fujinaka teaches to secure the resin made cap 9 to the resin made boss 2, as recited above, the teaching can be relied on to read as, if any, welding a thrust member which is made of resin to an end of a housing which is also made of resin.

Furthermore, similar to the reason discussed above with respect to the allowability of claim 4, there is no motivation to modify Mori with Fujinaka's teaching in welding the seal 9 to the housing 5, because the seal 5 provided at the other end of the housing is positioned far away from the thrust plate 7 (when combined with Fujinaka), and does not affect the perpendicularity of the thrust plate 7, as shown in Fig. 2 of Mori. Applicants further submit that when considering to achieve a better perpendicularity of the thrust plate 9, the integral configuration of the housing 5 of Mori is much better than the assembled configuration provided by Fujinaka, which includes a boss and a later secured cap 9. Therefore, if one skilled in the art intends to achieve a better perpendicularity of the thrust plate, he would have chosen Mori's configuration without being modified by Fujinaka, since the modification with the cap 9 adversely impairs the perpendicularity of the thrust plate.

The Office Action further rejected claim 6 under 35 U.S.C. 103(a) as being unpatentable over Mori, in view of Tanaka.

In rejecting claim 6, the Examiner admitted Mori does not disclose that the housing and the sleeve are made of the same type of metal. The Examiner then cites Tanaka in teaching "a dynamic bearing having a housing and bearing sleeve made from steel".

With respect to claim 6, as currently amended, recites the limitation of: “a bearing sleeve made of sintered metal”, and “said housing is made of the same type of metal as said bearing sleeve, and said bearing sleeve is fixed on said inner periphery of said housing by welding **to configure a sintered metal to metal connection between said bearing sleeve and inner periphery of said housing**” (emphasis added). The bearing sleeve made of sintered metal has pores opened to the surface thereof, wherein melted metal generated by welding at the fixing portion between the bearing sleeve and the housing can be impregnated into the pores of the bearing sleeve through the surface openings thereof to effectively fix the bearing sleeve and the housing by anchor effect.

As such, the present invention as set forth in claim 6 requires a welding connection between a sintered metal (bearing sleeve) and a metal of the same type of the sintered metal (housing) which is neither taught, disclosed, nor suggested by Mori, Tanaka, or any of the other cited references, taken alone or in combination, and thus should be allowed.

New Claims

Claims 8 and 9 are newly added depending upon allowable independent claim 1, and thus should also be allowable.

CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-7, and the new claims 8 and 9 of the present application patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,
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